IN THE CLAIMS

1. (Currently Amended) A method for preferential disruption of malfunctioning cells in a living mammal, which comprises:

(a) administering a compound which associates with DNA in cells of said mammal, said compound comprising a pre-selected element selected from the group consisting of Pt, Ca, Ti, Br, I, Gd, Y and Ru; and then

(b) irradiating a selected region, in which malfunctioning cells having said compound associated with DNA are located, with line emission x-rays from an X-ray tube, said line emission X-rays being of an energy selected to cause emission of Auger electrons from said pre-selected element of said compound in a dose effective to disrupt DNA proximate to the irradiated pre-selected element, said dose for each activation of said X-ray tube being at least about 10^6 Gy localized with a distance of a few atomic diameters from the pre-selected element, said selected region being a localized region which predominantly contains the malfunctioning cells so as to localize the effects of disrupting DNA to the malfunctioning cells and to minimize the effect on normal cells.

2. (Original) A method according to claim 1, wherein the compound intercalates into the DNA helix.

3. (Original) A method according to claim 1, wherein the compound binds to the DNA.

4. (Original) A method according to claim 1, wherein the compound is substantially non-toxic.

5. (Original) A method according to claim 1, wherein the compound has an affinity for both normal and malfunctioning cells.

6. (Original) A method according to claim 5, wherein the compound is substantially non-toxic.

7. (Original) A method according to claim 1, wherein the compound has a selective affinity for malfunctioning cells.

8. (Original) A method according to claim 1, wherein the compound is selected from the group consisting of annamycin, bromodeoxyuridine, bromodeoxycytosine and iododeoxyuridine

9. (Original) A method according to claim 1, wherein the compound is iododeoxyuridine.

10. (Original) A method according to claim 9, wherein the compound is bromodeoxyuridine.

11. (Original) A method according to claim 1, wherein the compound is a ruthenium compound which binds to or intercalates into DNA.

12. (Original) A method according to claim 1, wherein the compound is cisplatin.

13. (Cancelled)

14. (Original) A method according to claim 13, wherein the pre-selected element of the compound is selected from the group consisting of Ru, I and Gd.

15. (Original) A method according to claim 13, wherein the malfunctioning cells of the mammal's body are superficial and the pre-selected element of the compound is Br.

16. (Original) A method according to claim 1, wherein the compound is selected to have a high rate of excretion by normal physiological processes.

17. (Previously Presented) A method according to claim 1, wherein the compound is selected for stability against dissociation of the pre-selected element during the time prior to excretion or metabolism of the compound.

18. (Original) A method according to claim 1, wherein an end window transmission x-ray tube producing bright line emission x-rays is used for irradiating.

19. (Previously Presented) A method according to claim 18, wherein an e-beam generated in the x-ray tube is focused on a thin target having a thickness selected to provide the line emission x-rays, said thickness not exceeding about 40 μm, said target being inside the tube

and functions as part of the end window.

20. (Previously Presented) A method according to claim 19, wherein the target and the e-beam energy are selected to provide monochromatic line emission x-rays having an energy above and sufficiently near the K-absorption edge of the pre-selected element of the compound to cause said emission of Auger electrons.

21. (Original) A method according to claim 20, wherein the thin target is selected from the group consisting of Mo, Ag, La, Sr and Tm.

22. (Previously Presented) A method according to claim 19, wherein the target and the e-beam energy are selected to provide monochromatic line emission x-rays having an energy above and sufficiently near the L-absorption edge of the pre-selected element of the compound to cause said emission of Auger electrons.

23. (Original) A method according to claim 22, wherein the thin target is Rb.

24. (Original) A method according to claim 23, wherein the pre-selected element of the compound is Pt.

25. (Cancelled)

26. (Currently Amended) A method according to claim 1 ~~25~~, wherein the dose of at least

about 10^6 Gy is released within a distance from the element of the compound of up to about 10 angstroms.

27. (Original) A method according to claim 1, wherein step (b) is repeated at least once.

Claim 28 (original) A method according to claim 27, wherein Auger electrons are released during each repetition of step(b) with a dose of at least about 10^6Gy.

29. (Original) A method according to claim 28, wherein the dose of at least about 10^6 Gy is released within a distance from the element of the compound of up to about 10 angstroms.

30. (Original) A method according to claim 1, wherein step (b) is performed on cells removed from the mammal.

31. (Original) A method according to claim 30, wherein after step (b) is performed, the removed cells are returned to the mammal.

32. (Original) A method according to claim 30, wherein after step (b) is performed, the removed cells are transplanted.

33. (Original) A method according to claim 1, wherein step (a) and step (b) are performed on cells removed from the mammal.

34. (Original) A method according to claim 33, wherein after step (b) is performed, the

removed cells are returned to the mammal.

35. (Original) A method according to claim 33, wherein after step (b) is performed, the removed cells are transplanted.

36. (Previously Presented) A method according to claim 1, wherein the malfunctioning cells are tumor or cancer cells and the mammal is a human.

37. (Original) A method according to claim 36, wherein the compound intercalates into the DNA helix.

38. (Original) A method according to claim 36, wherein the compound binds to the DNA.

39. (Original) A method according to claim 36, wherein the compound is substantially non-toxic.

40. (Original) A method according to claim 36, wherein the compound has an affinity for both normal and cancerous cells.

41. (Original) A method according to claim 40, wherein the compound is substantially non-toxic.

42. (Original) A method according to claim 36, wherein the compound has a selective

affinity for cancerous cells.

43. (Original) A method according to claim 36, wherein the compound is selected from the group consisting of annamycin, bromodeoxyuridine, bromodeoxycytosine and iododeoxyuridine.

44. (Original) A method according to claim 36, wherein the compound is iododeoxyuridine.

45. (Currently Amended) A method according to claim 36, wherein the compound is bromodeoxyuridine.

46. (Original) A method according to claim 36, wherein the compound is a ruthenium compound which binds to or intercalates into DNA.

47. (Original) A method according to claim 36, wherein the compound is Cisplatin.

48. (Cancelled)

49. (Original) A method according to claim 48, wherein the pre-selected element of the compound is selected from the group consisting of Ru, I and Gd.

50. (Original) A method according to claim 48, wherein the cancerous cells of the human's

body are superficial and the pre-selected element of the compound is Br.

51. (Original) A method according to claim 36, wherein the compound is selected to have a high rate of excretion by normal physiological processes.

52. (Previously Presented) A method according to claim 36, wherein the compound is selected for stability against dissociation of the pre-selected element during the time prior to excretion or metabolism of the compound.

53. (Original) A method according to claim 36, wherein an end window transmission x-ray tube producing bright line emission x-rays is used for irradiating.

54. (Previously Presented) A method according to claim 53, wherein an e-beam generated in the x-ray tube is focused on a thin target having a thickness selected to provide the line emission x-rays, said thickness not exceeding about 40 μm, said target being inside the tube and functions as part of the end window.

55. (Previously Presented) A method according to claim 54, wherein the target and the e-beam energy are selected to provide monochromatic line emission x-rays having an energy above and sufficiently near the K-absorption edge of the element of the compound to cause said emission of Auger electrons.

56. (Original) A method according to claim 55, wherein the thin target is selected from the

group consisting of Mo, Ag, La, Sr and Tm.

57. (Previously Presented) A method according to claim 54, wherein the target and the e-beam energy are selected to provide monochromatic line emission x-rays having an energy above and sufficiently near the L-absorption edge of the pre-selected element of the compound to cause said emission of super electrons.

58. (Original) A method according to claim 57, wherein the thin target is Rb.

59. (Original) A method according to claim 58, wherein the pre-selected element of the compound is Pt.

60. (Cancelled)

61. (Currently Amended) A method according to claim 36 ~~60~~, wherein the dose of at least about 10^6 Gy is released within a distance from the element of the compound of up to about 10 angstroms.

62. (Original) A method according to claim 36, wherein step (b) is repeated at least once.

63. (Original) A method according to claim 62, wherein Auger electrons are released during each repetition of step (b) with a dose of at least about 10^6 Gy.

64. (Original) A method according to claim 63, wherein the dose of at least about 10^6 Gy is released within a distance from the element of the compound of up to about 10 angstroms.

65. (Previously presented) A method according to claim 1, wherein the malfunctioning cells are cancerous cells and the mammal is a human, wherein the method comprises:

(a) administering to the human the compound which associates with DNA, in cells of said human, said compound comprising a pre-selected element selected from the group consisting of Br, Ru, I, Gd and Pt; and then

(b) irradiating at least once, by means of an end window transmission x-ray tube, the selected region, in which the cancerous cells having said compound associated with DNA are located, with line emission x-rays of an energy selected to cause emission of Auger electrons from said pre-selected element of said compound in a dose effective to disrupt DNA proximate to the irradiated pre-selected element, said dose for each activation of said x-ray tube being at least about 10^6 Gy within a distance from the pre-selected element of the compound of up to about 10 angstroms.

66. (Original) A method according to claim 65, wherein the compound intercalates into the DNA helix.

67. (Original) A method according to claim 65, wherein the compound binds to the DNA.

68. (Original) A method according to claim 65, wherein the compound is substantially non-

toxic.

69. (Original) A method according to claim 65, wherein the compound has an affinity for both normal and tumorous cells.

70. (Original) A method according to claim 69, wherein the compound is substantially non-toxic.

71. (Original) A method according to claim 65, wherein the compound has a selective affinity for tumorous cells.

72. (Original) A method according to claim 65, wherein the compound is selected from the group consisting of annamycin, bromodeoxyuridine, bromodeoxycytosine and iododeoxyuridine.

73. (Original) A method according to claim 65, wherein the compound is iododeoxyuridine.

74. (Original) A method according to claim 65, wherein the compound is bromodeoxyuridine.

75. (Original) A method according to claim 65, wherein the compound is a ruthenium compound which binds to or intercalates into DNA.

76. (Original) A method according to claim 65, wherein the compound is cisplatin.

77. (Original) A method according to claim 65, wherein the compound is selected to have a high rate of excretion by normal physiological processes.

78. (Previously Presented) A method according to claim 65, wherein the compound is selected from stability against dissociation of the pre-selected element time prior to excretion or metabolism of the compound.

79. (Previously Presented) A method according to claim 65, wherein an e-beam generated in the x-ray tube is focused on a thin target having a thickness selected to provide the line emission x-rays, said thickness not exceeding about 40 μm, said target being inside the tube and functions as part of the end window.

80. (Previously Presented) A method according to claim 79, wherein the target and the e-beam energy are selected to provide monochromatic line emission x-rays having an energy above and sufficiently near the K-absorption edge of the pre-selected element of the compound to cause said emission of Auger electrons.

81. (Original) A method according to claim 80, wherein the thin target is selected from the group consisting of Sr, Ag, La, and Tm.

82. (Previously Presented) A method according to claim 79, wherein the target and the e-

beam energy are selected to provide monochromatic line emission x-rays having an energy above and sufficiently near the L-absorption edge of the pre-selected element of the compound to cause said emission of Auger electrons.

83. (Original) A method according to claim 82, wherein the thin target is Rb.

84. (Original) A method according to claim 83, wherein the pre-selected element of the compound is Pt.

85. (Currently Amended) A method for treating malfunctioning cells in a living mammal, which comprises:

(a) providing a kit comprising

(1) an x-ray tube having a target comprising a selected metal, said tube being capable of emitting monochromatic line emission x-rays; and (2) a compound comprising a selected element selected from the group consisting of Pt, Ca, Ti, Br, I, Gd, Y and Ru, said compound being capable, upon administration to said mammal, of associating with DNA in cells of said mammal; the selected metal of said target and the selected element of said compound being selected together:

(i) for said metal of said target to emit line emission x-rays having an energy above and near the K-absorption edge or the L-absorption edge of the selected element of said compound, and

(ii) for said element of said compound to release a dose of Auger electrons upon irradiation by said line emission x-rays in a dose effective to disrupt DNA proximate to the irradiated selected element, said dose for each activation of said X-ray tube being at least about 10^6 Gy localized with a distance of a few atomic diameters from the pre-selected element;

(b) administering the compound to the mammal and

(c) irradiating a selected region, in which malfunctioning cells having said compound associated with DNA are located, with the monochromatic line emission x-rays form the x-ray tube to cause emission of Anger electrons from said pre-selected element of said compound in ~~a~~ the dose effective to disrupt DNA proximate to the irradiated pre-selected element.

86. (Previously Presented) A method according to claim 85, wherein said x-ray tube is an end window transmission x-ray tube capable of emitting bright, line emission x-rays, said x-ray tube comprising an evacuated, elongated chamber having first and second ends, the first end being connected to a power supply, and within said chamber: electron emitter means near the first end for generating a beam of electrons; an end window transparent to x-rays at the second end, an inner portion of said end window comprising said target; and means for focusing said electron beam on said target.

87. (Previously Presented) A method according to claim 86, wherein the target has a thickness selected to provide the line emission x-rays, said thickness not exceeding about

40 μm.

88. (Previously Presented) A method according to claim 85, wherein the target is selected from the group consisting of Rb, Mo, Ag, La, Sr and Tm.

89. (Previously Presented) A method according to claim 85, wherein the compound is substantially non-toxic.

90. (Previously Presented) A method according to claim 85, wherein the compound has an affinity for both normal and malfunctioning cells.

91. (Previously Presented) A method according to claim 90, wherein the compound is substantially non-toxic.

92. (Previously Presented) A method according to claim 85, wherein the compound has a selective affinity for malfunctioning cells.

93. (Previously Presented) A method according to claim 85, wherein the compound is selected from the group consisting of annamycin, bromodeoxyuridine, bromodeoxycytosine and iododeoxyuridine.

94. (Previously Presented) A method according to claim 85, wherein the compound is

iododeoxyuridine.

95. (Previously Presented) A method according to claim 85, wherein the compound is bromodeoxyuridine.

96. (Previously Presented) A method according to claim 85, wherein the compound is a ruthenium compound which binds to or intercalates into DNA.

97. (Previously Presented) A method according to claim 85, wherein the compound is cisplatin.

98. (Cancelled)

99. (Currently Amended) A method according to claim 85 ~~98~~, wherein the pre-selected element of the compound is selected from the group consisting of Br, Ru, I, Gd and Pt.